

PACKAGING OF COSMETIC PRODUCTS, TYPICALLY A CASE WITH
SIDE CLASP

Field of the invention

The field of this invention is packaging of cosmetic products, and typically powder compacts for face care.

State of the art

5 In general, cases typically comprise:

- a hollow cover usually provided with a mirror on the inside,
- a recessed bottom, typically provided with an intermediate support for at least one receptacle in
10 which the said cosmetic product will be placed,
- a hinge, forming the connecting device between the said cover and the said bottom, hinging the said cover and allowing opening of the said case,
- a clasp or any means of locking and unlocking
15 the said cover with respect to the said bottom, to open and to close the said case, the clasp typically being a pushbutton. This clasp, located opposite the hinge of the case, is normally formed by cooperation between a closing element fixed to the cover and a closing element
20 fixed to the bottom or to the support fixed to the bottom, to ensure that the compact will remain closed except when it is opened intentionally.

There are very many methods known for making cases, which may apply to one or more constituents of the case,
25 particularly to the clasp or opening of the case.

Thus, the applicant has a number of patents including:

- patent FR 2 661 080 that describes a makeup case with a small clasp,
- 5 - patent FR 2 725 958 that applies to a case with a flush fitting clasp with assisted opening,
- patent FR 2 737 192 that describes a case with a pivoting cover provided with a hinge and flexible tabs,
- patent FR 2 755 352 that describes a case with
10 assisted opening,
- patent FR 2 755 353 that describes a case with an unlocking and pre-opening pushbutton,
- and patent FR 2 794 723 that describes a case with improved preliminary opening.

15

Problems that arise

Firstly, when cases according to the state of the art include assisted opening means, typically these means only enable rotation of the cover through a certain angle
20 or automatic tipping of the cover once the opening pressure is applied to the pushbutton.

A serious problem that occurs with this type of case is due to the fact that the manual opening gesture and / or the manual gripping gesture of the case can hinder
25 assisted or automatic opening of the cover, since the fingers are instinctively placed in front of and behind the back of the case to make it easier to grip.

Another problem is due to the fact that these assisted opening means usually include an elastic element

that is compressed when the cover is closed and expands when the cover is opened.

Although these methods have their advantages, the user may perceive them as being "mechanical" means more
5 like a child's jack-in-the-box in which a spring suddenly opens the cover, than a suitable means of conveying the image of a high quality product.

Therefore, the applicant had the idea of searching for a means of keeping a preliminary opening means, and
10 making opening of the cover more "supple", perceptible when the cover is rotated manually, possibly to open it further and rotate the mirror, or to close it again.

As illustrated in the state of the art mentioned above, the variety of assisted opening means already used
15 in the state of the art is very large, and each of these relatively specific means requires different modifications for each different case, which are therefore expensive.

Therefore, the applicant looked for a general means
20 that is applicable to a wide range of cases without needing to modify the design of each individual case.

Finally, another problem is to offer cases that are obviously different from cases according to the state of the art in terms of their appearance, but also their
25 "feel", in other words the tactile perception of the manual opening force of the case.

Description of the invention

The packaging according to the invention, typically a case, is designed for packaging cosmetic products and comprises a cover provided with the first portion of a
5 hinge, a recessed bottom possibly including an intermediate fixed to the said bottom and a receptacle in which the said cosmetic products will be placed, the said bottom or the said being provided with a second hinge portion, a hinge with an axis of rotation R formed by
10 cooperation between the said first and second portions of the hinge, a means of locking and unlocking the said cover with respect to the said bottom or the said mesh, typically a clasp, and possibly an applicator of the said cosmetic product.

15 It is characterized in that:

- a) the said packaging comprises a said driving means to open the said cover at least partially, as soon as the said clasp is activated manually,
- b) the said packaging comprises at least one
20 clasp, typically comprising a pushbutton located on a side part of the said packaging, laterally offset from a central plane P perpendicular to the said axis R, such that the said bottom is typically gripped between the thumb and one finger of one hand, applying pressure on
25 the said pushbutton along a direction D typically parallel to the said axis of rotation R, the said thumb and the said finger trigger the said opening of the cover without coming into contact particularly with the said

hinge, and this without hindering opening of the said cover under the action of the said driving means.

By thus orienting the manual grip of the case along a direction D typically parallel to the axis of rotation R of the hinge of the case, the invention discourages a user from putting her fingers on the rear part of the case where the hinge is located and / or the front part of the case.

10 Description of the figures

All figures are related to the invention.

Figures 1a and 1b are diagrams in which the ordinate shows the driving torque $C_M = M(\alpha)$ and the braking torque $C_F = F(\alpha)$ as a function of the angle α on the abscissa.

15 These curves intersect in the case shown in figure 1a, whereas they do not intersect in the case shown in figure 1b.

These curves correspond to a theoretical situation with a lack of friction. If friction is added, the behaviour is similar, except that the abscissa axis is offset upwards, as shown by the dashed line A-A parallel to the abscissa axis.

Figure 2 is a partly exploded perspective view illustrating an example of a driving means and an example of a braking means according to the invention, and a typical layout of this driving means and this braking means on a hinge.

In this case, the hinge is formed from two annular or tubular elements, the driving means and the braking means acting as cylindrically shaped axial pins.

Figure 3 shows a section along the centreline of the hinge showing the case in which one hinge element is a female annular or tubular element and the other hinge element is a male axial element, the driving means and the braking means are annular and adjacent to each other and are placed in the concentric space located between the two concentric hinge elements.

Figure 4 is a variant of figure 3, in which the first and second hinge portions comprise two parts, a left part and a right part, and in which either the driving or braking means cooperates with one of the two parts, the other means cooperating with the other part.

Figures 5a and 5b are sections through a driving means and a braking means of the annular type as shown in figures 3 and 4.

Figure 5a is a section in a plane perpendicular to the axis of the driving means or the braking means (centreline of the hinge), while figure 5b shows a section along this axis.

Figures 6a and 6b are sections through a driving means and a braking means of the axial type acting as a pin as shown in figure 2.

Figure 6a diagrammatically illustrates a driving means shown in section along the axis of the hinge, while figure 6b diagrammatically illustrates a braking means,

shown as a section perpendicular to the axis of the hinge.

Figure 7 is a sectional view along the axis of the hinge showing an embodiment that uses the embodiment in figure 4 (only the left part) and the embodiment in figure 2 (only the right part).

Figure 8 is similar to figure 1a, but the preliminary opening torque C_M has been replaced by a closing torque C'_M .

Figures 9a and 9b are perspective views of a rectangular case (6) according to the invention, figure 9a showing a view of the case when closed, and figure 9b a view of the case when open.

Figures 10a and 10b are top views of oval-shaped bottoms (7), with a single pushbutton (90) in figure 10a and two symmetrical pushbuttons (90) in figure 10b.

Detailed description of the invention

According to the invention, the said packaging may comprise the said "driving" means (4), and also an opposing "braking" means (5), the so-called driving means (4) and braking means (5) respectively applying a driving torque $C_M = M(\alpha)$ and a braking torque $C_F = F(\alpha)$ on the said cover, in opposite directions and with a predetermined force depending on the opening angle α of the cover.

Thus, the applicant found that inserting two opposing means, one acting as "driving" to open the cover and the other as "braking" to oppose the opening

movement, in a packaging, typically a case (6) comprising a cover (8) free to rotate around a hinge, makes the packaging very flexible when opening, to the extent that the means according to the invention make it possible to
5 obtain the required "touch" or tactile feel simply by choosing the values of the driving torque $C_M = M(\alpha)$ and the opposing braking torque $C_F = F(\alpha)$, so that the packaging can be adapted to suit the wishes of customers.

Furthermore, as will become clear later, the means
10 according to the invention are typically centred and located on or in the hinges (1) formed by cooperation of portions of the hinge (2, 3), that may be formed either by cooperation of an axial male part and a tubular female part, or formed from two tubular female parts fixed
15 together by a pin acting as a hinge pin.

Thus, any packaging forming a hinge closing means (1) may benefit from the invention, without needing to modify this packaging apart from its hinge. Therefore, the invention is of very general use.

20 According to the invention and as shown in figure 1a, the said driving torque $C_M = M(\alpha)$ and the braking torque $C_F = F(\alpha)$ may be chosen to obtain firstly the relation $C_M \geq C_F$ for an opening angle α varying from 0° to α_0 , the angle at which the said opposing torques are
25 balanced, the said cover then tending to open under the action of the said driving torque, and secondly the relation $C_M < C_F$ for an opening angle α more than α_0 , possibly as far as a cover stop position, the said cover

then having a resistance to opening or possibly tending to close again under the action of the braking torque, such that regardless of the opening angle α of the cover, at least one of the said opposing driving torque C_M and braking torque C_F is active on the said cover, such that the angle α_0 is within the angular range α varying from 60° to 160° .

But there may be friction forces in the said hinge (1) between the said first hinge portion (2) and the second hinge portion (3), sufficient so that the said cover can be in an equilibrium position for an opening angle α varying from approximately $\alpha_0 - \beta$ to $\alpha_0 + \beta$, so that angular equilibrium is possible with a range equal to 2β , typically between 30 and 90° , where β is larger when the said friction forces are higher. This case is shown diagrammatically by an intersection of the dashed line A-A in figure 1a with curves $C_M = M(\alpha)$ and $C_F = F(\alpha)$.

According to another embodiment of the invention shown in figure 1b, the said driving torque $C_M = M(\alpha)$ and braking torque $C_F = F(\alpha)$ may be chosen firstly such that the relations $C_M > 0$ and $C_F = 0$ are satisfied for an opening angle α varying from 0° to α_1 , the said cover then tending to open under the action of the said driving torque, and such that the relations $C_M = 0$ and $C_F > 0$ are satisfied for an opening angle α greater than α_2 as far as a stop position of the cover, the said cover then having a resistance to opening or possibly tending to close under the action of the braking torque, such that

the angles α_1 and α_2 define the limits of an angular equilibrium range $\alpha_1 - \alpha_2$ typically within the angular range $60^\circ - 160^\circ$, with the range $\alpha_2 - \alpha_1$ equal to at least 30° .

5 As in the previous case, the said hinge (1) may introduce sufficiently large friction forces between the said first hinge portion (2) and second hinge portion (3) so that the said cover has an equilibrium position for an opening angle α varying from approximately $\alpha_1 - \beta$ to $\alpha_2 +$
10 β so as to form an angular equilibrium range typically between 30 and 90° , where the angle β is larger when the said friction forces are higher. This case is shown diagrammatically by the intersection of the straight line A-A in dashed line in figure 1b with the curves $C_M = M(\alpha)$
15 and $C_F = F(\alpha)$.

Regardless of the embodiment of the invention, and as shown in figures 2, 3, 4 and 7, each of the said driving means (4) and braking means (5) may cooperate with the said first hinge portion (2) and second hinge
20 portion (3).

Thus, any rotation movement of one portion of the hinge with respect to the other is transmitted to the driving and braking means, which are potentially permanently active regardless of the said angle α ,
25 depending on the choices made for the opposing driving torque $C_M = M(\alpha)$ and braking torque $C_F = F(\alpha)$.

In the case of a case in which a mirror is fitted, the range in which the cover may be positioned by hand

varying from $\alpha_0 - \beta$ to $\alpha_0 + \beta$, or from $\alpha_1 - \beta$ to $\alpha_2 + \beta$ depending on the case, is approximately equal to an angle α varying from 100° to 150° .

According to one variant of the invention shown particularly in figures 3, 4, 5a and 5b, the said driving means (4) and / or braking means (5) may form annular or tubular elements (40, 50), typically in the form of rings, cooperating on the inside with either the first hinge portion (2) or the second hinge portion (3) forming a central hinge pin (11) of these annular or tubular elements, and cooperating on the outside with the other hinge portion forming a tubular portion (12).

According to another variant of the invention, illustrated particularly in figures 2 and 6a, the said driving means (4) and / or braking means (5) may form cylindrical elements (41, 51) typically in the form of pins, cooperating with the first hinge portion (2) and second hinge portion (3) forming a central axis for these hinge portions.

According to the invention, and as shown in figures 2 and 4, the said first hinge portion (2) and second hinge portion (3) may comprise two parts, a right part (11D, 12D) and a left part (11G, 12G), one of the driving means (4) or braking means (5) cooperating with one of the two parts, and the other means cooperating with the other part.

These parts may be symmetrical as is the case in figures 2 and 4, or asymmetric as is the case in figure 7. But this is in no way compulsory, and thus figure 3

illustrates the case of a "conventional" hinge that only includes a central part.

As shown specifically in figure 2, each of the said driving means (4) and braking means (5) forming the said
5 cylindrical elements (41, 51), may cooperate with the first and second hinge portions forming a central axis for these hinge portions acting as the right pins (41D, 51D) and the left pins (41G, 51G) to fix the said first and second hinge portions forming the right part (12D)
10 and the left part (12G) of the said hinge (1).

According to the invention, it is possible for the driving means (4) and / or the braking means (5) to comprise an angular adjustment means (410, 510) in particular enabling modifications to the torques C_M and
15 C_F , for example by varying the tension of the spring forming the driving or braking means, even after final assembly of the packaging. These pins are preferably provided with a decorative head typically like the rest of the hinge (1) to conceal the hinge pin itself and its
20 functional purpose.

As a non-limitative example, the said driving means (4) and / or the said braking means (5) may comprise one or two springs (44, 54) typically with helical turns in which the axis is the axis (10) of the said hinge, one of
25 its two ends (440, 550) cooperating with one of the two portions of the hinge, the other end (441, 551) cooperating with the other portion of the hinge, so as to obtain the said driving torque $C_M = M(\alpha)$ and braking torque $C_F = F(\alpha)$. See Figure 5b. These springs may be

metallic and may be designed to generate the required torques C_M and C_F as a function of the angle α while occupying a small volume.

Similarly, as a non-limitative example shown in figure 6b, the said braking means (5) may comprise or may be composed of axial cooperation between two non-cylindrical elements forming a friction element (56): a cam (560) typically forming a rigid internal element and a tubular element (561), typically made of an elastically and reversibly deformable material, with an internal profile facing the said cam chosen so as to obtain the said braking torque $C_F = F(\alpha)$, and in which one of the non-cylindrical elements (560, 561) cooperates with one of the two hinge portions (2, 3), the other element (561, 560) cooperating with the other hinge portion (3, 2).

Regardless of the type of driving means (4) and braking means (5), each of the driving means (4) and the braking means (5) may comprise two parts fixed in rotation, one part (42, 52) comprising a means (420, 520) of fixing it to one of the hinge portions (2) and the other part (43, 53) forming a means (430, 530) of fixing it to the other hinge portion (3).

As shown in figure 2, each means (420, 430, 520, 530) of fixing to one portion of the hinge (2, 3) may typically be formed by an axial assembly of a male part and a female part belonging to the said fixing means and the said hinge, along the axis of the said hinge.

The said male and female parts may typically be grooved, with a number N of ribs or grooves (20, 30, 45,

55) for the male part cooperating with a number N of grooves or ribs (20, 30, 45, 55) for the female part, where N typically varies from 3 to 18.

The invention is not limited to a particular
5 packaging, except that it must comprise a hinge formed from two hinge portions. The packaging according to the invention may typically be composed of cases, make-up powder compacts, cream pots, perfume receptacles with hinge.

10 The said packaging may form a typically round or oval shaped compact (6), in which the said clasp (9) and possibly the said pushbutton (90) are placed outside a prohibited area (71) of the said bottom (7), the said prohibited area (71) corresponding to a front and back
15 part of the said case between the planes P1 and P2, parallel to the said plane P, and that surround the said hinge. See figures 10a and 10b.

The said packaging may form a typically square or rectangular case (6), in which the said clasp (9) and
20 possibly the said pushbutton (90) are placed on one side or a side wall (72) of the said bottom (7) of the case (6). See figures 9a and 9b.

As shown in figure 10b, and in order to orient the manual grip, the said packaging may comprise two clasps
25 (9) or pushbuttons (90) placed symmetrically with respect to the said central plane P, the said two clasps (9) or pushbuttons (90) also forming manual areas for gripping the said packaging.

These pushbuttons (90) may form parts in relief, as shown in figure 10a, or recessed areas as shown in figure 10, or possibly parts that are flush with the bottom wall so as to avoid introducing a surface discontinuity with respect to the bottom, the contrast between the pushbutton and the bottom may typically be visual and based on a different colour.

Another purpose of the invention is a manufacturing process for a packaging according to the invention.

According to a first embodiment of the process, the so-called driving means (4) and braking means (5) act as right pins (41D, 51D) and left pins (41G, 51G) to fix the said first hinge portion (2) and second hinge portion (3) together, and after the said first and second hinge portions have been put into position, the so-called driving means (4) and braking means (5) are obtained and then assembled to the said first hinge portion (2) and second hinge portion (3), typically by axial click fitting at zero or almost zero stress, the opening angle α of the cover being close to 0° during assembly of the so-called braking means (5) and the opening angle α of the cover being close to 90° for the so-called driving means (4).

According to another embodiment of the process, the so-called driving means (4) and braking means (5) act as first and second pins to fix the said first hinge portion (2) and second hinge portion (3) together, and after the said first hinge portion (2) and second hinge portion (3) have been put into position, the so-called driving means

(4) and braking means (5) are obtained and then assembled to the said first hinge portion (2) and second hinge portion (3), typically by axial click fitting at zero or almost zero stress, the so-called driving means (4) and /
 5 or braking means (5) comprising an accessible fixing means (420, 430, 520, 530) at one end and comprising an angular adjustment means (410, 510) such that, after it has been assembled, the angle of the said accessible fixing means can be adjusted later, particularly by
 10 orientation of the said ribs and grooves (20, 30, 45, 55) enabling rotation with respect to each other, to obtain the so-called opposing driving torque $C_M = M(\alpha)$ and braking torque $C_F = F(\alpha)$.

The ribs and grooves (20, 30, 45, 55) may be chosen
 15 to be sufficiently deep so that there is no sudden change from one groove to the next while opening the said packaging, the torque necessary for such a passage being more than the opposing torques $C_M = M(\alpha)$ and $C_F = F(\alpha)$, but not too deep so that the angle can be adjusted
 20 without destroying the ribs.

It is advantageous if the ribs are oriented so as to facilitate the said angular adjustment without damaging the said grooves.

25 Example embodiments

The figures contain example embodiments.

Rectangular shaped cases were made as shown diagrammatically in figures 9a, 9b, and oval shaped cases

were made corresponding to the bottoms (7) shown diagrammatically in figures 10a and 10b.

The cross-hatched areas in figures 9b, figures 10a and 10b show the recessed part of the bottom comprising the receptacle or the mesh (73). Similarly, cross-hatching is used in figure 9b to show the mirror (81) on the cover (8).

The covers corresponding to the bottoms in figures 10a and 10b are not shown in the figures, since the main geometric characteristics of these covers can be deduced from the characteristics of the corresponding bottoms, as shown in figure 9b.

The hinge (1) of the case (7) was materialised firstly by the axis of rotation R (10) in figures 9a and 9b, and by materialization of the second portion of the hinge (3) of the bottom (7) in figures 10a and 10b.

Concerning the clasp, the reference (9) in figure 9a denotes the clasp assembly (mostly invisible), while the reference (90) denotes the part of the clasp (typically a pushbutton) on which manual action can be applied, typically pressure by one finger to open the case, the references (70) and (80) more specially denoting the parts of the clasp fixed to the bottom (7) and the cover (8), respectively. The pushbutton (90) is fixed to the bottom (7), and it is marked with the reference (70); it is shown in relief in figure 10a, recessed in figure 10b, and in the plane of the bottom wall (72) in figures 9a and 9b.

In cases (6) according to the invention, the central plane P (60) perpendicular to the hinge (1) and the axis R, was only materialized in figure 9b, to illustrate the lateral offset of the pushbutton (70, 90), the bottom (7) being gripped by the sides or lateral walls (72) that are typically parallel to the plane P in the case of a square or rectangular case.

On the other hand, in the case of round or oval cases, and as shown in figures 10a and 10b, the front part and the back part form a prohibited area (71) delimited by planes P1 and P2 adjacent to the hinge (1) or portions of the hinge (2, 3), the said lateral wall (72) being defined as the part of the case or the bottom located outside the said prohibited zone (71).

The arrows shown in bold lines on the case (6) in figure 9a and the bottom (7) of the case in Figure 10a, materialise the direction D (62) of gripping of the case, typically parallel to the direction R (10) of the hinge (1). When the case (6) is gripped, typically by its bottom (7) which is thicker than the cover (8), the finger applies pressure on the bottom closing element (70) that cooperates with the cover closing element (80) to form the clasp (9) of the case with its pushbutton (90) typically fixed to the bottom.

The cases in figures 9a to 10 are fitted with hinges like those shown in figures 2, 3, 4 and 7.

Spring loaded driving means (4) were made, like those shown diagrammatically in figures 2, 5b and 6a. These means form an opening torque of the cover in

figures 1a and 1b, and a closing torque of the cover in figure 8.

Spring-loaded or friction braking means (5), that can always be treated like friction forces, were made as
5 shown in figure 6b.

These means (4, 5) resulted in a driving torque C_M and a braking torque C_F similar to those shown in Figures 1a, 1b and 8.

The portions of the hinge (2, 3) and the driving
10 means (4) and braking means (5) were assembled in two steps: firstly the hinge portions are oriented to assemble either the driving means (4) or the braking means (5) such that its torque is zero, and then once the first means has been assembled, the hinge portions are
15 oriented so that the other means can be assembled. Thus, during assembly, there is no need to pretension the driving means or the braking means, particularly when they comprise a spring, which is an advantage.

Figure 2 in particular illustrates details of the
20 axial assembly of the different parts forming the driving means (4) and the braking means (5), and cooperation of these means with the hinge portions (2, 3) of the hinge (1).

25 Advantages of the invention

With cases according to the invention, the user can grip the case with one hand, and then open it without the manual grip of the case hindering or even partially counteracting the rotation movement of the cover, and

therefore automatic opening of the case due to the presence of a driving means (4).

Furthermore, the invention makes it possible to have very fine control over the manual force applied to the cover as a function of the opening angle α , so that almost any type of feel or sensation can be created while opening.

Furthermore, the means according to the invention may be adapted to any type or any form of case or packaging comprising a cover fixed to a body or a bottom through a hinge.

List of references

Hinge	1	
Hinge centreline - axis of rotation R ...	10	
Male or axial part	11,	11D*, 11G**
Female or tubular part	12,	12D*, 12G**
Means of fixing to the braking means	13	
Means of fixing to the driving means	14	
First portion of hinge (cover)	2	
Groove or rib cooperating with 45 or 55 .	20	
Second portion of hinge (bottom or mesh) ...	3	
Groove or rib, cooperating with 45 or 55	30	
Driving means	4	
Annular or tubular driving means	40	
Cylindrical driving means (pin)	41,	41D*,

	41G**
Angular adjustment means.....	410
Part fixed to 2	42
Fixing means (notches).....	420
Part fixed to 3	43
Fixing means (notches).....	430
Spring	44
End fixed to 42.....	440
End fixed to 43.....	441
Groove or rib of 42 or 43	45
Braking means	5
Annular or tubular braking means	50
Cylindrical braking means (pin)	51,51D*,51G**
Angular adjustment means.....	510
Part fixed to 2	52
Fixing means.....	520
Part fixed to 3	53
Fixing means to 3.....	530
Spring	54
End fixed to 52.....	540
End fixed to 53.....	541
Groove or rib of 52 or 53	55
Friction element	56
Cam (central part).....	560
Tubular element.....	561
Packaging or case	6
Central plane P	60
Lateral part	61
Gripping direction D of 6 or 7	62

Bottom	7
Closing element 9	70
Prohibited area	71
Side - side wall	72
receptacle	73
Cover	8
Closing element 9	80
Mirror	81
Clasp	9
Pushbutton	90

*D = right side

**G = left side